Neuroticism, Social Support and Activities of Daily Living in the Health Longevity Survey of the Old in China

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Abstract

Previous studies concerning with the relationship of neuroticism and social support in areas of health suggested that neuroticism is highly associated with health problems and social support could reduce the effect of neuroticism on health as a mediator. Therefore, this study examined these findings for older people in China. Based on Chinese Longitudinal Health Longevity Survey dataset, 11,147 participants living in 22 of the 31 provinces in China were interviewed in 2000 by self-report questionnaires involving with family households, psychological characteristics, financial support, family support and activities of the daily living. The results showed that neuroticism influences old people's ADL impairments, although this impact would be decreased by the intervention of social support. Social support also shows their influences on ADL impairment for the elder. However, the influences of social support are less than that of neuroticism on ADL impairments. In addition, social support involving with its type and quality show the effect of mediation on the relationship between neuroticism and ADL impairment, although the number of social support network has no significant effect on reducing the possibility of ADL impairment of people with high neuroticism. Finally the adequacy of social support shows more influences than the other components on neuroticism and ADL impairment, and also has greater influences to reduce ADL impairment to people with high neuroticism.

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Thank you everyone again!

Plagiarism statement

I declare that the work submitted here for this Msc in the psychology of individual differences dissertation is my own work and contains no section copied in whole, or in part, from any other source, unless it is explicitly identified and acknowledged by detailed references to the source material.

CONTENTS

1. Introduction

1.1 Background

With the increases of age studies, old people's health becomes a hot topic which is involved with personality traits and social support. Previous studies found that neuroticism is highly associated with health problems and social support could reduce the effect of neuroticism on health as a mediator. Therefore, this paper tried to explore the relationship between neuroticism, social support and health which are measured by ADL impairments.

1.2 Research Objectives and Methods

This study examined the relationship between neuroticism, social support and ADL impairments based on self-report questionnaires from Chinese Longitudinal Health Longevity Survey dataset. Two group hypotheses following were tested for the aim of this study:

(1) Neuroticism:

a. Old people with high Neuroticism have strong possibility of the ADL impairment.

b. Old people with high Neuroticism have strong possibility of the ADL impairment under control of influences by social support.

(2) Social support:

a. The perceived adequacy of social support for the elder can be affected by the number of network members and the type and amount of support.
b. The perceived adequacy of support, the number of network, and type of social support are influenced by Neuroticism for old people.
c. Social support can provide mediation effects on the relationship between Neuroticism and the ADL impairment. Positive social support can reduce the possibility of the ADL impairment, and also can significantly decrease the effect of Neuroticism on Old people's ADL impairment.

The results were assessed by Correlation and Multiple Regression Analysis from SPSS 16.0

1.3 Structure of This Study

There are six parts involved in this paper. The first part is an introduction which shows the background, motivation for the research, objective and methods. The overview of this study is presented in the first part. The second part reveals literature review of this study which is included basic introductions of neuroticism and social support, the effects of neuroticism and social support on health, and the relationship between neuroticism, social support and health. The third part points out information of the sample, the methods and statistical analyses applied in this study. Subsequent

part shows the results via SPSS 16.0, and the discussions which explain the result is in the fifth part. The last part is a conclusion which is integrated by previous parts in this paper, and limitations also are included in this part.

2.1 Literature review

2.1 Neuroticism and health longevity

2.1.1 Personality traits and health

Recent studies have identified there are an association between personality traits and health (Aline et al., 2009; Burgess et al., 2000; Duberstein et al., 2003; Schnittker, 2005; Kim et al., 2005; Smith & Spiro, 2002). People with distressed personality seem to be more likely to suffer the problems of health such as high blood pressure, diabetes, and high cholesterol (Haffuner et al., 1998; MacMahon et al., 1990). Based on Five Factor Model, high neuroticism and low extraversion are related to poor health status (Duberstein et al., 2003; Kempen, Jeicic & Ormel, 1997), and contribute to physical morbidity (Coodwin & Engstrom, 2002). For example, Extraversion can reduce the possibility of death from respiratory disease (Beverly et al., 2007), and the increasing risk of death of cardiovascular disease would be derived from high level of neuroticism (Chapman, Duberstein & Lyness, 2006). Additionally, the studies show that people with high both in agreeableness and conscientiousness seem to have better health status (Bogg and Roberts, 2004; Margarete, Knoch & Cassano, 1999; Miller, Griffin & Hart, 1999). More specially, people with high agreeableness are likely to regulate negative thoughts for improving the health of the body, and can avoid the suffering from neuroticism-linked distress in some degree (Ode & Robinson, 2007; Rueda, Posner & Rothbart, 2004), while conscientiousness is a predictor of living longer (Friedman et al, 1995; Ingledew, 1999). Compared with four personality traits

above, Openness to experience seems to have no significant influences on direct physical health, but also can predict the health behaviors which are linked to physical health (Booth-Kewley & Vickers, 1994).

2.1.2 The introduction of Neuroticism

Neuroticism, as one of personality traits, is described as low level of emotional stability. High level of Neuroticism is usually labeled as moody, nervous, or anxiety (Eysenck, 1990). It was described previously into disorders of sense and motion due to general affection of the nervous system (Cullen, 1769), while later concepts of Neuroticism focused on general negative emotional stability (Tellegen, 1985). Some studies found that neuroticism was associated with negative psychological states such as low level of subjective well being, lack of identity achievement (Denissen & Penke, 2008), the other studies argued that it is correlated with low level of physical health, hard of social relationship, and unhealthy behaviours (Fraley & Shaver, 2000; Ozer & Benet-Martinez, 2006).

2.1.3 Neuroticism and health longevity

Neuroticism is most often mentioned in health studies due to its correlations are profound involving with depression, maladaptive reactions to illness, low level of identity achievement and low level of social relationship (Denissen & Penke, 2008; Ozer & Benet- Martinez, 2006). In previous studies, Neuroticism is a prospective predictor of health problems (Chapman et al., 2006; Friedman, 2000; Krause, Liang &

Keith, 1990; Lauver & Johnson, 1997). People with high level of neuroticism seem to more likely to suffer from Cardiac death (Keen, Goldberg & Beebe, 1874), chronic pain (Wade et al., 1992), high blood pressure (Wiilmas et al., 2008), lung cancer (Partrick & Hayden, 1999), and ADL impairment (Oxman & Hull, 1997; 2000). Although some studies indicated that old people has less level of neuroticism than the younger (Mann et al., 2006; Steunenberg et al., 2005), the influences of neuroticism are still significant for health aging (Friedman, Hawley & Tucker, 1994; Lauver & Johnson, 1997). For example, old people with high in neuroticism were reported to have more possibility of Alzheimer's disease (Chatterjee, et al., 1992). Thus it can be seen that neuroticism is highly associated with health supported by various evidences.

However, it is hard for recent researches to ignore the controversy about relationship between Neuroticism and health. One argument pointed out the relationship between neuroticism and health is not significant, because the association between Neuroticism and health problems is more likely to show their feeling than actual problems themselves (Friedman, 1990). According to this view, Friedman (1990) revealed there is a "disease-prone personality". In Some supportive studies, people with disease-prone personality were found that more likely to perceive and report symptoms of disease (Costa & McCrae, 1987; Wade et al., 1992; Waston & Pennebaker, 1989). For example, many coronary disease people with anxious or nervous would report their feeling of the pain however it is not due to actual coronary disease (Friedman, 1990). The main explanation of these evidences focused on the

role of Neuroticism in an individual's pain tolerance (Sternback, 1975). People high in Neuroticism always show low level of pain tolerance due to their high level of autonomic reaction to stimuli (Lynn & Eysenck, 1961). Therefore, the studies based on self-report measurement should be questioned because Neuroticism which are involved with valid and invalid reports of health problems were questioned to the extent which can influence significantly on individuals' physical and psychological health.

Another explanation was involved with relationship between Neuroticism and daily problems. Increasing evidences showed that: individuals with high scores of Neuroticism are more likely to experience more daily problem in the life so that they are more like to experience the disease involving with these problems (Friedman, 1990). For instance, according to the studies by Friedman, Hall and Harris (1985), people with high Neuroticism tended to be involved with competition from work or the problems of interpersonal relationship, which were significantly associated to hypertension and heart disease. Thus, the relationship between mortality and neuroticism is not enough as an explanation for health status of people with high neuroticism.

Additional argument is derived from the relationship between Neuroticism and other risk factors of health. According to previous studies, high Neuroticism individuals who had great health problems were associated with unhealthy behaviours such as

smoking and drinking (Friedman, 2000; Orth-Gomer & Scheidermn, 1996), and unhealthy eating patterns (Brownell & Fairburn, 1995), and also are highly associated with social support (Hemingway & Marmot, 1999; Lindsay, Smith & Hanlon, 2001; Pedersen, Domburg, & Larsen, 2004). The interaction between neuroticism and health behaviors and social support was complicated, so that it is hard to explain clearly the influences of neuroticism on disease. That is to say, although various studies shows the significant relationship between neuroticism and health, the finding from these studies should be examined seriously due to no or less control for other risk factors of health.

In brief, neuroticism is significant associated with various studies, and it also impact on old people's health. However, there are arguments for questioning this relationship in recent studies. Some researchers believe that the association between Neuroticism and health problems is more likely to show their feeling than actual problems themselves, another researches pointed that the relationship between mortality and neuroticism is not enough as an explanation for health status of people with high neuroticism. Finally, the results of neuroticism and health studies should be examined again due to controlling for other risk factors.

2.2 Social Support and Health longevity

2.2.1 The definition of social support and its influenced factors.

Social support is usually considered as assistance in difficult life situations by the

others. According to Cobb (1976), social support was defined as “the individual belief that one is cared for and loved, esteemed and valued, and belongs to a network of communication and mutual obligations”(p.300).Therefore, in response to this definition of social support, it have been seen that determined by individuals and social environment. Some studies found that individual’s age, gender, size of family, the status of marriages can influence individual’s possibility of providing and receiving social support (Edens, Larkin, & Abel, 1992; Finlayson, 1976; Sarason, Sarason, & Pierce; 1990). Even some research found that Gene could determine people’s behaviors of social support (Horwitz et al., 1992). Alternatively, another several studies focused on the influences on Personality. For example, social support was linked to interpersonal trust and social disorder (Barlow, 1988), self-esteem and a feeling of control (Sarason et al., 1983). With regard to Big Five of personality traits, Extraversion was found that impacts on the utilization of social support (Swickert, et al., 2002), and Openness was considered as a factor involving with providing social support to the others (Mester, et al., 1997). Similarly some evidences show that people with high in Agreeableness tend to be easier to perceive social support from the others (Hoth, et al., 2007) and conscientious people receive less social support (Lu & Argyle, 1992, Patricia, Christensen, & Lawton, 1997). Finally, Neuroticism was associated to the perception of positive social support (Shurgot & Knight, 2005). This view supported by Sarason et al. (1987)’s study which showed that Neuroticism had negative correlation with satisfaction of social support. That is to say, perception of social support would reflect some parts of personality traits.

2.2.2 The components of social support studies

The effort of social support was explored from various aspects. According to Johnsen et al. (1990), basic stages of the influences of social support were involving with simple questions like: How many support providers war in the social support network, what types of social support from these providers? And how are the support behaviors for the receivers? Do they consider them as useful helps? How does social support vary across individuals? However, the categories of social support in these questions are more emphasized than the others in the studies involving with social support and Health.

In previous social support studies, most researchers focused on the different influences from various types of social support on health. According to House (1981), four main kinds of social support are described as emotional support, appraisal support, informational support and instrumental support. Generally speaking, emotional support is involved with family members, close friend or community sources that provide care, love, or trust to comfort individuals' emotion. The second support is informational support which is associated with advice or suggestion for special problems and demands. The third one is instrumental support. Instrumental support refers to explicit assistances such as financial support which is seen as the most direct form of social support. Appraisal support is the last kinds of support which feedback and assessment of the information. These four kinds of social support are explored as factors associated with health in various studies (Berkman, 1995;

Berkman, Leo-Summers, & Horwitz, 1992; Bloom, 1990; House, Robbins & Metzner, 1982; Holahan & Moos, 1982). For some research regarding older people, these four types of social support also play an important role on longevity health. For example, emotional support may be linked with better physical functioning (Penninx et al., 1997; Seeman et al., 1995), and instrumental support would reduce the possibility of disability and mortality for the elder (Penninx et al., 1997; Weinberger, et al., 1990). Besides four main categories (House, 1981), social support could be analyzed from perceived support and actual support (Lin et al, 1999), or divided with emotional support, companionship support and informational support (Wan et al., 1996). However, social support was discussed by the methods of Oxman and Hull (1997).

However, the types of social support are not enough to explain the influences of social support on health (Johnsen et al, 1990). Recent studies started to measure the role of social support with health from various aspects. For example, Oxman and Hull (1997) discussed the relationship between Neuroticism, Social support and Health based on three components: social network, type and amount of support, and adequacy of social support.

- **Social network**: it refers to the characteristics of support providers. It usually get information about these providers, such as which type of the relationship between individuals and support provider (spouse, sibling, or offspring), and how frequency of contact in social network. Thus, the characteristics and size of

network are easy to be analyzed via this component. Some studies showed that the characteristics of social network is associated with the mortality of the elderly (Case et al., 1992; Williams et al., 1992), however, more studies supported that there are positive and negative influences on healthy longevity for old people(Bowling & Farquhar, 1991; Bramwell, 1990; Stoller & Pugliesi, 1991). With regard to size of social network, studies also proved that there is no significant relationship between family numbers and health of the elder (Bowling & Farquhar, 1991; Lewis & Meredith, 1988; Krause, 1995). However, some research found that the number of emotionally close numbers play an important role on the health of old people (Bowling & Farquhar, 1991; Oxman et al., 1992; Seeman & Berkman 1998). That is to say, the elderly who have some close people for emotional communication can keep health in some degree, and these people may be the members of family or even friends (Matt & Dean, 1993). Thus, some researchers suggest friendship may be more important than the other relationship such as family (Kanisasty & Norris, 1993; Seeman & Berkman, 1988), because friendship provide the strong feeling of close on a regular basis (Albrechi & Adelman, 1987). In brief, although size of social network is not likely to show clear correlation with health of the elder, the number of emotionally close members can take account for old people's active life expectancy in some degree because it showed some influences on health in studies (Albrechi & Adlman, 1987; Cohan & Antonucci, 1989; Matt & Dean, 1993; Oxman & Hull, 1997).

- **Type and amount of social support**: it refers to which kinds of behaviors from support providers. To be more specific, there are three main behaviors according to Oxman and Hull (1997): emotional support, guidance support, and financial support. Emotional support is analyzed commonly in the researches such as some studies of social network mentioned above, and it includes behaviors of comforting the elder's nervous, caring for their subjective well-being, communicating their feelings and thinking, and so on. In general, guidance support refers to provide advices to do something or resolve some problems. For the elder, guidance support is usually involved with the instructions of diet or activities which maybe come from doctors. In addition, financial support is important for the oldest old, which provides housing, food and medical fee. however, it is found that financial support incur some problems due to the feelings of dependency in several studies (Wortman & Conway, 1985), although it is necessary for the disable elder to keep health (king et al., 1993).

- **Adequacy of social support**: it refers to the availability and utility of social support involving with problem solving. The adequacy of social support includes two parts: the objective benefits and the subjective assessment from supportive behavior by others. In particular, this subjective assessment of social support can influence physical conditions of the elder (Antonucci, 1985). For example, some studies proved that this subjective assessment of social support is associated with the decrease of depressive symptoms (Bowling & Farquhar, 1991; George, 1989;

Oxman et all., 1992). One of the most common explanations is that individual who experience adequate social support subjectively may tend to receive appropriate type and amount of social support, although the results of some studies are opposed to it (Kessler et al., 1994). Additional explanations are involved with person's subjective well-being. That is to say, this perception of adequacy can increase the elder's feelings of being cared or valued which also act as a buffer to the effect of stressful situations (Heller et al., 1986; Kamarck & Hoberman, 1985). In this sense, it is reasonable to take account for perceived adequacy of social support in the studies of health longevity.

2.2.3 The role of social support in health longevity studies

Many researchers have focused on the relationship between social support and health (Bloom, 1990; Bolger & Rafaeli, 2003; Murrell, Norris & Chipley, 1992). For instance, mortality was related to support social in Berkman's studies (1979; 1992), and endocrine and immune systems also were linked with the level of social support (Uchino et al., 1996). Even in some studies social support was reported that would reduce the possibility of mental disorder (Milne, 1999). Furthermore, social support also showed the association with the health of the elder (Bowling & Browene, 1991; Matt & Dean, 1993; Oxman et al., 1992; Oxman & Hull, 1997). For example, low level of activities of daily living (ADL) was linked with social support frequently for older people (King et al., 1993; Wilcox, Kasl & Berkman, 2000). Compared with the younger, the elder have more face to face contact for keeping physical and

psychological health (Sarason et al., 1987). Dementia also could be prevented in some degree via family and social support (Schulz et al., 2002; Roth et al., 2005).

Furthermore, social support was found as a buffering effect in many studies. For example, people with depression appear to have less possibility of disease through the interrelation of social support (Oxman & Hull, 1997; Schulz & Decker, 1985; Siegal, Calsyn & Cuddihee, 1987; Turner & Noth, 1988). High level of social support also can reduce the heart disease mortality for people with high Neuroticism (Hemingway & Marmot, 1999; Lindsay, Smith & Hanlon, 2001; Pedersen, Domburg, & Larsen, 2004). And people with unhealthy behaviours suffered less possibility of lung cancer via the influences of social and family supports (Kim et al., 2005; Nijboer et al., 2001; Williamson, Shaffer, 2001). In particular, social support can be as remission for the older which suffered from various health problems with aging (Patrick & Hayden, 1999; Reis et al., 1994; Rodin, McAvay, 1992). Some studies found that social support seems to be more power to intervene the influences of depression and Neuroticism for the elder than the younger (Hult, Tedlie, & Lehn, 1995; Koening et al., 1993). The explanation of these differences was fixed but it is more likely that social support itself is more important for the older than the younger (Koening, et al., 1993).

More specially, according to the composition of social support social support show their effect of mediation on health differently. As discussed above, social support such

as emotional support, appraisal support and informational support impact on health simultaneously, however, different types of social support show different influences on health in previous studies. For instance, according to studies by Oxman and Hull (1997), Guidance supports are more important than emotional support in some situations such as casualty. additionally some studies found that the number of people's social contacts and their quality of social support help people with type-D personality reduce their behavior of smoking which is highly related to health, however, the quality of social support showed significant influences on the behavior of smoking than the number of social contracts (Denollet & Brutsaert, 2000; Schiffer et al., 2005; Williams et al., 2007). However, these researches are not enough in the areas of social support studies with health longevity.

3. Method

3.1 Hypotheses

There are two group hypotheses following for testing the relationship between Neuroticism and social support with the ADL impairment for the elderly.

(1) Neuroticism:

a. Old people with high Neuroticism have strong possibility of the ADL impairment.

b. Old people with high Neuroticism have strong possibility of the ADL impairment under control of influences by social support.

(2) Social support:

a. The perceived adequacy of social support for the elder can be affected by the number of network members and the type and amount of support.

b. The perceived adequacy of support, the number of network, and type of social support are influenced by Neuroticism for old people.

c. Social support can provide mediation effects on the relationship between Neuroticism and the ADL impairment. Positive social support can reduce the possibility of the ADL impairment, and also can significantly decrease the effect of Neuroticism on Old people's ADL impairment.

3.2 Participants

The sample in this paper is derived from Chinese Longitudinal Health Longevity Survey dataset (CHLHLS) (Gu & Dupre, 2008; Zeng & Gu, 2008). In order to investigate status of old people in China, questionnaires in this Survey consists of 9 components: family households, psychological characteristics, lifestyle, and activities of the daily living, financial support, family support, min-mental state, economic resources, and medical care services. In this sample, 11, 147 Participants living in 22 of the 31 provinces in China were interviewed in 2000. there are 41.5% male and 58.5% female, and the average age of participant was 91 years old (SD= 7.6) which from 78 to 119 years old. 81.1% of participants were living with household member and 11.9% lived alone, additionally, 7.0% of participants stayed in an institution. The distribution of total category of residence in this sample was that 30.2% in city, 31.4% in town, and 38.4% in rural. Finally, this sample consisted of 78.7% of participants with the active, 15.7% of participants with mild disability, and 5.6% of participants with severe disability with regard to ADL impartment.

3.3 Measures

3.3.1 Neuroticism

Neuroticism, one of personality traits in the Big Five and describes the emotional stability of people. It is associated with anxiety, anger, moody, depression in various studies (Friedman, 1990; Matthews & Deary, 1988). In this paper, the assessment of Neuroticism depended on participants' answers from the component of psychological

characteristics in the questionnaires. And the scores concerning Neuroticism were transferred into five levels of perceived Neuroticism symptoms such as: Never, Seldom, Sometimes, Often, and Always.

3.3.2 Social support

In this paper, social support was measured by three components such as the number of social network, the type and amount social support and the adequacy of social support which were based on previous studies (Oxman &Hull, 1997). First, the number of emotionally close members was considered as a key factor of social network due to significant influences in previous studies (Albrechi & Adlman, 1987; Cohan & Antonucci, 1989; Matt & Dean, 1993; Oxman & Hull, 1997). Thus, it is important in this paper to focus on people who are living with participant or visit frequently in Chinese Longitudinal Health Longevity Survey. According to the survey conducted in 200, the number of emotionally close members can be calculated up on basis of the result of questionnaires “frequency of close communication”, “the number of people living with you”, “frequency of visit by children”, “frequency of visit by sibling”, and “frequency of visit by friends”.

With regard to the Type and amount of social support, emotional support, guidance support and financial support were explored by previous studies (Oxman & Hull, 1997). However, financial support seems to be more important in this factor than emotional support and guidance support, because the number of emotionally close

members was tested actually as an aspect of emotional support, and guidance support depends on a few special conditions. Thus, the type and amount of social support were measured based on the main effect of financial support, which was collected from the questionnaire “could main financial support maintain your daily cost”. Accordingly, the scores in the type and amount of social support presented the status of financial support mainly, and high scores in this factor explained low level of financial support that it could be not enough for the participants.

Finally, the adequacy of social support was measured based on the answer of the questions “self-reported support from family” and “the assistances came from the others in daily life”. Five points (1 to 5) were showed in the perceived adequacy of social support like that: very good, good, so so, bad, and very bad. Therefore, low scores of adequacy of social support referred to good quality of social support based on its value of five points.

3.3.3 Activities of Daily Life

Activities of Daily Living (ADL), which reflects the current health status of participants, were applied widely in various studies (Robine, Methers, & Bucquet, 1993). It was introduced by Lawton and Brody in their research about the assessment of older people (1969). And it includes Barthel ADL index, the Katz Index, Performance test of ADL, and Functional independence Measurement (Chon, 1995; Lawton & Brody, 1969). In this paper, the ADL impairment was measured by

functional independence of the elder such as Bathing, Dressing, Toileting, Transferring, Continence, and Feeding. Participants in CLHLS 2000 reported their current status concerning these six aspects, and the results were assessed into three level “active”, “mild disability”, or “severe disability” in response to whether need for assistance (Lawton & Brody, 1969). Therefore, we can define that: participant was labeled as “active” when has none of these six activities are impaired; participant was labeled as “mild disability” when has one or two of these six activities are impaired; participant was labeled as “severe disability” when has three or more activities are impaired (Zeng et al., 2001). Thus, a participants’ functional status was classified as being “active”, “disability”, and “severe disability”.

3.3.4 Covariates

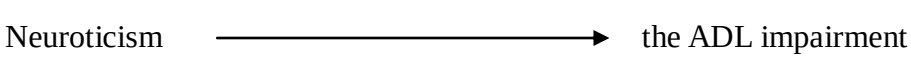
Relevant covariates should be considered due to larger number of participants. Similar to previous studies, sex, age, and the category of residence variables were controlled before the assessment of the relationship between ADL impairment, the adequacy of social support, financial support, and social support network. However, beside from the covariates mentioned above, the variable of co-residence had to be checked in this paper. There are three types of co-residence for the elders in this sample: with household members, alone or in an institution. However, the reasons of the older in an institution are significant different between in China and in Western countries. In China, the oldest old people who live in an institution are most likely as a result of childlessness or homelessness, while they are due to disability in studies of Western

countries (Zeng et al., 2000). Because of these situations, this covariate was confounded with others to a large degree, and thus it should be exclude.

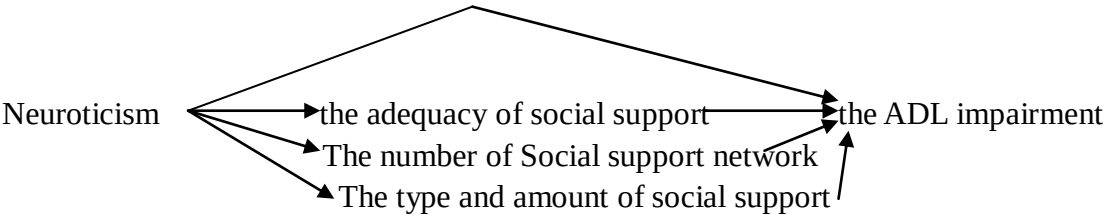
3.4 statistical analyses

All the data were analyzed by SPSS 16. The hypotheses which linked with the relationship between two variables were analyzed by correlation and multiple regressions. For example, hypothesis 1 was tested both in assessments of the relationship between Neuroticism and the ADL impairment, and the relationship between Neuroticism and the ADL impairment after controlling for social support. In hypothesis 2, 2(a) and 2(b) were tested via correlation and regression by the relationship between the relationship between three components of social support, and the relationship between Neuroticism and three components of social support. With regard to the hypothesis 2(c), the effect of mediation in social support was tested with the application of multiple regression, and Sobel Test (Sobel, 1982; Preacher & Hayes, 2004; 2008).

A: Basic Model



B: Model 2



As shown in Figure above, basic model explores the relationship between Neuroticism and the ADL impairment. More specially, the ADL impairment for the older was regressed by their scores of Neuroticism. Furthermore, three components of social support were regressed separately on Neuroticism in model 2, and then, the ADL impairment was regressed on Neuroticism and three components of social support. Finally, difference between the relationships between Neuroticism and the ADL impairment in two models was tested by Sobel Test.

4. Results.

Table 1 shows that correlation between Neuroticism, three components of social support and ADL impairment. According to this table, we can see clearly that ADL impairment had significantly positive correlation with Neuroticism ($p<0.001$), and also had significant correlation with three components of social support ($P<0.001$). However, the adequacy of social support and the type and amount of social support had positive relationship with the ADL impairment, while the number of emotionally close members had negative correlation with the ADL impairment. In this sense, people with high score in Neuroticism had strong possibility of the ADL impairment, and reported great quality of social support, enough financial support, and small number of emotionally close members. With regard to the relationship between Neuroticism and social support, Neuroticism had significantly correlation with the adequacy of social support and the type and amount of social support but had no significantly correlation with the number of emotionally close members. That is to say, the number of emotionally close members is hard to explain their scores in Neuroticism. Finally, it is found that the adequacy of social support was correlated with the type and amount of social support and the number of emotionally close members. However, the comparison between with the influences of Neuroticism and social support found that Neuroticism was more correlated with the ADL impairment of the elder than the adequacy of social support, the type and amount of social support, and the number of emotionally close members. That is to say, the influences of Neuroticism seem to be greater on the ADL impairment for the older than that of

social support.

Table 1

	The adequacy of social support	The type and amount of social support	Neuroticism	ADL impairment	The number of Close members
The adequacy of social support	1	.067**	-.056**	.041**	-.063**
The type and amount of social support	.067**	1	.068**	.101**	-.067**
Neuroticism	-.056**	.068**	1	.272**	-.011
ADL impairment	.041**	.101**	.272**	1	-.054**
The number of close members	-.063**	-.067**	-.011	-.054**	1

*P<0.05; **P<0.001

The influences of Neuroticism on the ADL impairment were supported by Table 2 and Table 3. Table 2 shows the relationship between Neuroticism and the ADL impairment in basic model, while Table 3 shows the relationship between Neuroticism and the ADL impairment with the adequacy of social support, the type and amount of social support, and the number of social support network. In these tables, the association between with Neuroticism and the ADL impairment is stronger than the relationship between adequacy of social support, the type and amount social support and the number of social support network with the ADL impairment. In addition, we can see the influences of Neuroticism on the ADL impairment with three components was less than that of without three components. In other words, Neuroticism showed significant association with the ADL impairment of the older, however, its influences would be decreased with the intervention from social support.

Table 2 Coefficients of Basic Model

	Unstandardized Coefficients		Standardized Coefficients		
	b	*Std. Error*	*β*	*t*	*p.*
(Constant)	.848	.015		56.666	.000
Neuroticism	.050	.002	.272	29.839	.000

Table 3

	Unstandardized Coefficients		Standardized Coefficients		
	b	*Std. Error*	*β*	*t*	*p.*
(Constant)	1.081	.026		41.214	.000
adequacy of social support	.020	.006	.036	3.494	.000
The type and amount of social support	.019	.005	.041	3.891	.000
Neuroticism	.011	.002	.049	4.714	.000
The number of SS network	-.007	.001	-.047	-4.527	.000

Table 4

	Unstandardized Coefficients		Standardized Coefficients		
	b	*Std. Error*	*β*	*t*	*p.*
N(Adequacy of social support)	-.023	.004	-.056	-5.69	.000
N(the number of SS network)	-.012	.011	-.011	-1.12	.261
N(the type and amount of social support)	.026	.004	.068	7.25	.000

Therefore, in order to explain the meditation of social support, the relationships between Neuroticism and the adequacy of social support, the type and amount of social support, the number of social support network were summarized in Table 4. Neuroticism were significantly associated with the quality of social support and the type and amount of social support, however, it is no significantly related to the number of social support network. Thus, social support can influences the order's neuroticism though two ways such as the quality of social support and the type and amount of social support. However, the number of emotionally close members cannot be linked with people's Neuroticism. In addition, the quality of social support showed greater association with neuroticism of the older than the type and amount of social support.

Furthermore, Table 5 summarized the relationships between the adequacy of social support, the number of social support network and the type and amount of social support with ADL impairment. It is clear that these three components of social support were significantly associated with the ADL impairment ($p<0.001$): the adequacy of social support and the type and amount of social support were positively associated with ADL impairments, while the number of social support members was negatively associated with ADL impairments. Compared with the result of Table 3, we can see the adequacy of social support, the type and amount of social support, and the number of social support network were significantly associated with ADL impairment both with and without the influences of Neuroticism. However, the type and amount

of social support had greater association with ADL impairment than the other components without the effect of neuroticism according to table 5.

Table 5

	Unstandardized Coefficients		Standardized Coefficients		
	b	*Std. Error*	*β*	*t*	*p.*
Adequacy of social support	.023	.006	.041	4.13	.000
the number of SS network	-.009	.002	-.054	-5.41	.000
the type and amount of social support	.049	.005	.101	10.78	.000

Table 6

	Unstandardized Coefficients		Standardized Coefficients		
	b	*Std. Error*	*β*	*t*	*p.*
(Constant)	.799	.016		50.370	.000
Neuroticism	.049	.002	.266	29.264	.000
The type and amount of social support	.040	.004	.084	9.190	.000

Table 7

	Unstandardized Coefficients		Standardized Coefficients		
	b	*Std. Error*	*β*	*t*	*p.*
(Constant)	1.079	.023		46.849	.000
Neuroticism	.010	.002	.043	4.342	.000
Adequacy of social support	.024	.006	.043	4.377	.000

Accordingly, the effects of mediation in social support were assessed from the adequacy of social support and the type and amount of social support. Table 6 shows the results of model 1 involved with Neuroticism and the type and amount of social support. According to table 6, Neuroticism and the type and amount of social support were both positively associated with ADL impairment. However, the association between Neuroticism and ADL impairment was smaller in model 1 than in basic model. That is to say, the relationship between Neuroticism and ADL impairment become smaller than that with the influences of social support concerning its type and amount. Subsequently the significance of this difference was assessed by Sobel Test (Preacher & Hayes, 2004; 2008). It was measured based on unstandardized regression coefficient the association between Neuroticism and the type and amount of social support ($a=0.026$) and its standard error ($S_a=0.004$), as well as unstandardized regression coefficient for the relationship between the type and amount of social support and the ADL impairment ($b=0.040$) and its standard error ($S_b=0.004$). After calculated, we found that the change of Neuroticism between basic model and model 1 was significant (Std. Error=0.0002, $p=5e\text{-}8<0.001$). Therefore, social support with its type and amount showed their mediation effects on the relationship between Neuroticism and ADL impairment.

Similarly, Table 7 shows the result of model 2 which were involved with Neuroticism and the adequacy of social support. According to this table, Neuroticism and the adequacy of social support also both had significantly positive correlation with the

ADL impairment. However, it is clear that association between Neuroticism and ADL impairment was smaller in model 2 than in basic model. In other words, the relationship between Neuroticism and ADL impairment become smaller than that are influenced by social support' quality for participants. Therefore, this change would be measured by Sobel Test (Preacher & Hayes, 2004; 2008). Sobel Test measured the significance of this change based on unstandardized regression coefficient the association between Neuroticism and the adequacy of social support (a=-0.023) and its standard error (S_a=0.004), as well as unstandardized regression coefficient for the relationship between adequacy of social support and ADL impairment (b=0.024) and its standard error (S_b=0.006). After calculated, we found that the change of Neuroticism between basic model and model 1 was significant (Std. Error= 0.0001, p=0.0010). Therefore, the quality of social support showed their mediation effects on the relationship between Neuroticism and ADL impairment.

5. Discussion

5.1 Interpretations of the Findings

The present study examined the relationship between neuroticism, social support and ADL impairment. According to the result, neuroticism influences old people's ADL impairments, although this impact would be decreased by the intervention of social support. Social support also shows their influences on ADL impairment for the elder. However, the influences of social support are less than that of neuroticism on ADL impairments. According to construction of social support (Johnsen et al., 1990; Oxman and Hull, 1997), there are three components of social support: the number of social support network, the type and amount of social support, and the adequacy of social support. In this study, social support involving with its type and quality show the effect of mediation on the relationship between neuroticism and ADL impairment, although the number of social support network has no significant effect on reducing the possibility of ADL impairment of people with high neuroticism. In addition, neuroticism has significantly associated with the type and amount of social support, and the adequacy of social support, although the number of social support network has no significant related to neuroticism. Therefore, it is clearly found that the number of social support network has no significant effect on neuroticism and the relationship between neuroticism and ADL impairment. This finding is consistent with previous studies (Bowling & Farquhar, 1991; Lewis & Meredith, 1988; Krause, 1995). With regard to other two components, the type and amount of social support can influence the level of neuroticism for the older. For example, older people with high level of

neuroticism would require more emotional social support and financial support than the others (king et al., 1993). Finally the adequacy of social support shows more influences than the other components on neuroticism and ADL impairment, and also has greater influences to reduce ADL impairment to people with high neuroticism.

5.2 Neuroticism and Social Support

Several studies have found that there is an association between neuroticism and social support (Hult, Tedlie, & Lehn, 1995; Koening et al., 1993; Sarason et al., 1987; Shurgot & Knight, 2005). Consistently, neuroticism has a significant association with social support in this study. However, because construction of social support was examined separately in this study (Johnsen et al., 1990; Oxman and Hull, 1997), three components of social support show different relationship with neuroticism. Neuroticism has associations with the type and amount of social support, and the quality of social support while has no significant association with the number of social support network.

More specially, old people with high neuroticism tend to reported worse quality of social support. In other words, high level of neuroticism would incur that people are not satisfied with the quality of social support. This finding is consistent with previous studies (Heller et al., 1986; Kamarck & Hoberman, 1985; Kessler et al., 1994). Another result with the coherence of previous studies is the relationship between neuroticism and the number of social support network. although the number of

emotionally close members has association with neuroticism in some studies (Albrechi & Adlman, 1987; Cohan & Antonucci, 1989; Matt & Dean, 1993; Oxman & Hull, 1997), it shows no significant influences on neuroticism in this studies.

With regard to the type and amount of social support, old people with high neuroticism would were influenced by different types of social support. For instance, financial support is more important for old people's health in especial when with high neuroticism. On one hand, old people require financial social involving with medicine fee, housing, and food. In China, social security and medical insurance e is not applied widely compared with western countries. In particular, most people over 80 years old reply on financial support by their children. Accordingly, financial support shows more significantly importance in this study. On the other hand, financial support could provide the sense of security in developing countries, and reduce the feelings of life pressure. Thus, it can comfort people who have high neuroticism in some degree.

5.3 Neuroticism and ADL Impairment

Although some studies argued the influences of neuroticism with health (Costa & McCrae, 1987; Wade et al., 1992; Waston & Pennebaker, 1989), neuroticism showed significant association with ADL impairment in this study. Perhaps for the older with high level of neuroticism, the demands of assistance are more than the average. Thus, in fact the reports from people with high neuroticism reflect their demands of

assistance of the activities of daily living than actual impairments of ADL.

5.4 Social Support and ADL Impairment

It is clear that the direct effects of social support on ADL impairment, which are supported by previous studies (Bloom, 1990; Bolger & Rafaeli, 2003; Murrell, Norris & Chipley, 1992). However, different components of social support have different influences on ADL impairments. The type and amount of social support have more influences on ADL impairment than the number of social support network and the quality of social support in this study. Perhaps Chinese older people are more influenced by what types of social support than how these social supports are. For example, as discussed above, old people who are supported by financial support regularly can reduce their possibility for ADL impairments in China. In addition, the number of social support network shows their significant effect only on ADL impairments in total results. More specially, the elder seem to have less ADL impairments when they have great number of emotionally close members. The reasons of this relationship are complex, but perhaps old people can be cared more carefully when they have more social support providers. Finally, the quality of social support is also associated with ADL impairment in this study (Bowling & Farquhar, 1991; George, 1989; Oxman et al., 1992), although its influences are lower than other two components. In other words, the self-report quality of social support has less importance than objective conditions of support.

5.5 Neuroticism, Social Support, and ADL Impairment

According to the result in this study, people with high neuroticism are more involved with ADL impairments. However, high neurotic people would report the decreased possibility of ADL impairments after the intervention of social support. This main relationship between neuroticism, social support and ADL impairments are consistent with previous studies which are involved with neuroticism, social support and health (Hemingway & Marmot, 1999; Lindsay, Smith & Hanlon, 2001; Pedersen, Domburg, & Larsen, 2004), although there is little of study to examine ADL impairments influenced by neuroticism and social support.

For neuroticism, on one hand, the influences of neuroticism are decreased after the interventions of social support. On the other hand, neuroticism still can impact on ADL impairments significantly. For social support, it is clearly found that social supports play a mediator role on the relationship between neuroticism and ADL impairment. That is to say, social support can buffer the negative influences of neuroticism and reduce the possibility of ADL impairments for the older. With the consistence of previous studies (Oxman & Hull, 1997; Schulz & Decker, 1985; Siegal, Calsyn & Cuddihee, 1987; Turner & Noth, 1988), social support provides positive power to people for avoiding the possibility of diseases. However, different components of social support show different result which examined as a mediator in this study. As a mediator, the type and amount of social support and the adequacy of social support can reduce the influences of neuroticism on ADL impairment, while the

number of social support network have no significant effect to reduce the effect from neuroticism. That is to say, in order to keep health, social support is promoted by the type and quality for the older.

5.3 Limitations

There are a few of limitations in this study. For example, the relationship between neuroticism, social support and impairment should be examined after controlling for health behavior. Because health Behavior is highly related with neuroticism, and also significantly associated with social support and ADL impairments, the influences of social support may be impacted by health behavior on the relationship between Neuroticism and ADL impairments. Another limitation is that the explanations of result are less involved with Chinese background based on this large number of sample.

6. Conclusion

This study has attempted to examine the relationship between neuroticism, social support and ADL impairments for the elder. Based on a large sample from Chinese Longitudinal Health Longevity Survey dataset (CHLHLS) (Gu & Dupre, 2008; Zeng & Gu, 2008), the relationships between neuroticism, social support and ADL impairments were explored by Correlation and Multiple Regression Analysis. The results showed that: neuroticism and social support are highly associated with ADL impairments for old people, while neuroticism has influences on the type and amount of social support and the self-report quality of social support. After comparison with the influences of neuroticism with and without social support, it is found that social support can reduce the possibility of people with high neuroticism. More specially, the type and amount of social support can influence the effect of neuroticism on ADL impairments. Also, better quality of social support can help old people to lessen the possibility of diseases. However, the number of social support network has no significant effect as a mediator. In addition, there are new finding concerning the relationship between neuroticism, social support and health in this study: the type and amount of social support shows more influences on the relationships between social support and ADL impairment, however, the adequacy of social support become more power on the effect of reducing the possibility of ADL impairments for people with high neuroticism. Finally, health behaviors should be examined and controlled in further studies due to their high association with neuroticism, social support, and ADL impairments in literature review.

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